

Appl. No. 10/707,152
Amd. Dated October 14, 2005
Reply to Office Action Dated June 8, 2005

Amendments to the Specification:

Please replace the Abstract with the following paragraph:

An apparatus and method useful for acquiring information from a subsurface formation penetrated by a wellbore contemplate the use of a tubular body adapted for connection within a drill string disposed in the wellbore. The tubular body is equipped with one or more protuberances (e.g., ribs) defining an expanded axial portion. A probe is carried by the tubular body at or near a first location within the expanded axial portion of the body where the cross-sectional area of the expanded axial portion is a minimum. The probe is movable between retracted and extended positions. In another aspect, the inventive apparatus may further include a cover releasably-secured about the probe for protecting the probe while drilling. In a further aspect, the inventive apparatus may include a shearable backup support carried by the tubular body azimuthally opposite the probe permitting release of the apparatus from the wellbore in the event of a failure. In yet another aspect, the probe is at least partially carried within a debris-clearing channel formed in a protruding portion of the tubular body to promote ~~fee~~ free movement of the probe within the wellbore.

Please replace paragraph [0010] with the following paragraph:

It is furthermore well known that the velocity of circulation fluids inside a wellbore has a direct effect ~~of~~ on the thickness and integrity of the mud cake (the higher the velocity, the lower the sealing capabilities of the mud cake), which in turn will result in a local increase of the formation pressure near the wellbore wall (also called dynamic supercharging). This effect typically reduces the accuracy of the formation pressure as measured by a probe on a tool. In

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order to reduce the velocity effects when such a tool is operated and fluids are circulated in the wellbore, it is desirable to increase the flowing area in the annulus, thus reducing fluid velocity near the probe.

Please replace paragraph [0076] with the following paragraph:

The tubular body 12 may be further equipped with a fourth rib that spans substantially the length of the expanded axial portion radially opposite the first rib (see, e.g., Figures 7A-7B).

Other configurations are depicted in Figures 7C, 8, 9, 10A and 10B.

Please replace paragraph [0079] with the following paragraph:

According to a particular embodiment of the apparatus represented by Figures 11A-11C, the first location 24 lies on a rib 14 within the expanded axial portion 20, and the probe 22 is at least partially carried within a bore 28a/28b within a channel 26 formed in the rib at or near the first location 24 (see also Figure 1). The rib 14 extends radially beyond the retracted probe 22 such that the probe is recessed by a distance D within the rib when the probe is retracted. The channel 26 has a width sized for closely bounding a portion of the probe 22 (i.e., packer 25) and the channel extends transversely (generally azimuthally) from the probe through a side of the rib 14 opposite the direction of drill string rotation (assuming rotary drilling; see arrow 27), as shown particularly in Figures 11A and 11C. In this manner, wellbore debris is free to flow along the channel 26 away from the probe 22 during drilling. This may be contrasted with the rib 14" 14' shown in Figure 12, which has no debris channel or probe recess depth D, and consequently exhibits a buildup of debris 30 that can impede the movement of the probe 22 within upper bore region 28a.

Please replace paragraph [0082] with the following paragraph:

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In another embodiment, shown in Figure 14, a first annular groove is formed in the wall of the upper bore region 28a in the protuberance, and a second annular groove is formed in the side wall of the cover ~~32"~~ 32'. The first and second annular grooves align to form a toroidal space when the cover is secured about the probe. A shearable ring 34 is disposed in the toroidal space for releasably securing the cover ~~32"~~ 32' to the bore region 28a.

Please replace paragraph [0083] with the following paragraph:

Alternatively, with reference to Figure 15, an annular groove 29 is formed in the wall of the bore region 28a in the rib 14, and the side wall of the cover ~~32"~~ 32' is equipped with a shearable annular flange 33 at an end thereof adapted to fit the annular groove 29.

Please replace paragraph [0093] with the following paragraph:

Turning now to Figures 18-19, the piston head ~~44"~~ 44' can be made to collapse within the piston body ~~42"~~ 42' of the back-up support ~~40"~~ 40' rather than shearing or abrading or eroding the back-up support. This is accomplished with the use of shear pins 52 to connect the piston head 44' and piston body ~~42"~~ 42', and a plate or "shoe" 50 hinged at pin 51 to supply an axial load to the shear pins 52 when the shoe 50 is loaded by an amount (e.g., via vigorous engagement with wellbore wall W) that exceeds the predetermined shear threshold.

Please replace paragraph [0094] with the following paragraph:

The hinged shoe ~~50"~~ 50' can be oriented axially (see Figure 19) rather than radially (as in Figure 18) to apply the desired load to shear pins 52, depending on the preferred method of retraction. If rotation of the apparatus 10 is the preferred method, the hinged shoe 50 should be oriented as shown in Figure 18. If pulling axially on the drill string would be the preferred method of extraction of the apparatus 10, the hinged shoe ~~50"~~ 50' should be oriented as shown in

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Figure 19. The advantage of this method versus the previously described method is that there are no large pieces left in the hole, although it sacrifices simplicity.